WOLF CREEK
NUCLEAR OPERATING CORPORATION

November 14, 2013

A. J. Camp, Jr
Plant Manager

WO 13-0093

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

Reference: Letter WO 13-0057, dated August 14, 2013, from A. J. Camp, Jr., WCNOC, to USNRC

Subject: Docket No. 50-482: Licensee Event Report 2013-007-01, "Nonfunctional Class 1E Electrical Equipment Air Conditioning Unit Results in Longer than Technical Specification Completion Time"

Gentlemen:

The Reference submitted Licensee Event Report (LER) 2013-007-00, "Nonfunctional Class 1E Electrical Equipment Air Conditioning Unit Results in Longer than Technical Specification Completion Time." This supplement revises the root cause and corrective actions of the Class 1E electrical equipment air conditioning unit failure.

This letter contains no commitments. If you have any questions concerning this matter, please contact me at (620) 364-4110, or Mr. Michael J. Westman at (620) 364-4009.

Sincerely,

A. J. Camp, Jr

AJC/rlt

Enclosure

cc: C. F. Lyon (NRC), w/e
N. F. O'Keefe (NRC), w/e
S. A. Reynolds (NRC), w/e
Senior Resident Inspector (NRC), w/e

IE22
NRR

NRC FORM 366 U.S. NUCLEAR REGULATORY COMMISSION
(10-2010)

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 10/31/2013

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA/Privacy Service Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects.resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
WOLF CREEK GENERATING STATION	05000 482	1 OF 4

4. TITLE Nonfunctional Class 1E Electrical Equipment Air Conditioning Unit Results in Longer than Technical Specification Completion Time

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
										05000
06	17	2013	2013	007	01	11	14	2013	FACILITY NAME	DOCKET NUMBER
										05000

9. OPERATING MODE

1

10. POWER LEVEL

100

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: *(Check all that apply)*

☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(i)(C)	☐ 50.73(a)(2)(vii)
☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(C)	☐ OTHER
☐ 20.2203(a)(2)(vi)	☒ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME	TELEPHONE NUMBER (Include Area Code)
Michael Westman, Manager Regulatory Affairs	(620) 364-4009

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
D	VI	FLT	Sporlan	Y					

14. SUPPLEMENTAL REPORT EXPECTED

☒ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☐ NO

15. EXPECTED SUBMISSION DATE

MONTH	DAY	YEAR
09	30	2013

ABSTRACT *(Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)*

On June 17, 2013 at 1111 Central Daylight Time (CDT), the Class 1E electrical equipment air conditioning unit, SGK05A, was declared nonfunctional due to an analysis of an oil sample that showed elevated levels of aluminum. As a result, Technical Specification (TS) Limiting Condition for Operation (LCO) 3.0.3 was entered and a plant shutdown was commenced.

On June 17, 2013, enforcement discretion was sought to permit noncompliance with TS 3.8.4, TS 3.8.7, TS 3.8.9, as well as LCO 3.0.3, to permit additional time to complete repairs and restoration of SGK05A before a plant shutdown would be required. An additional 168 hours was requested to restore SGK05A to a functional status such that the Completion Time of LCO 3.0.3 would expire at 1111 CDT on June 24, 2013. The Nuclear Regulatory Commission granted approval of the requested enforcement discretion on June 17, 2013. The replacement of the SGK05A compressor and testing to restore functionality was completed at 2220 CDT on June 21, 2013.

PLANT CONDITIONS AT THE TIME OF THE EVENT

Mode 1
100% power
There were no structures, components or systems that were inoperable and contributed to the initiation or limited mitigation of the event.

DESCRIPTION OF THE EVENT

On June 17, 2013, the results of an analysis of an oil sample taken from the "A" Class 1E electrical equipment air conditioning (A/C) unit [EIIS: VI, ACU], SGK05A, showed elevated levels of aluminum. Additionally, the unit was observed to have increased vibration levels and running with elevated Amperes, approximately 20% less than the rated full load amperage of the motor (55 Amperes). This information was discussed with the equipment manufacturer. The compressor's pistons and connecting rods are made of aluminum so the concern was that these parts were damaged. The likely cause of this damage was slugging/hydraulicing of the compressor, which is the introduction of a liquid into a system meant for gas. It was concluded that the equipment could no longer be considered reliable to support the mission time of supported systems. The last maintenance performed on the equipment was on May 28, 2013, when the SGK05A compressor was replaced.

Since the unit could not be relied on to meet its required function, the Class 1E electrical equipment air conditioning (A/C) unit, SGK05A, which cools the 'A' train safety related electrical equipment rooms was declared nonfunctional per Technical Requirement (TR) 3.7.23, "Class 1E Electrical Equipment Air-Conditioning (A/C)." TR 3.7.23 requires two Class 1E electrical equipment A/C trains be functional in Modes 1 through 4. Because of the essential support function provided by the Class 1E electrical equipment A/C trains, the correct application of the Technical Specification (TS), upon discovery of a nonfunctional Class 1E electrical equipment A/C train, is to immediately enter the applicable Conditions and Required Actions under TS 3.8.4, "DC Sources – Operating," TS 3.8.7, (Inverters – Operating," TS 3.8.9, "Distribution Systems – Operating," as well as Limiting Condition for Operation (LCO) 3.0.3. LCO 3.0.3 requires action to be taken within 1 hour to place the plant in Mode 3 within 7 hours, in Mode 4 within 13 hours, and in Mode 5 within 37 hours. The Shift manager entered the applicable TSs including LCO 3.0.3 at 1111 Central Daylight Time (CDT) on June 17, 2013. A plant shutdown was started at 1125 CDT on June 17, 2013.

On June 17, 2013, enforcement discretion was sought to permit noncompliance with TS 3.8.4, TS 3.8.7, TS 3.8.9, as well as LCO 3.0.3, to permit additional time to complete repairs and restoration of SGK05A before a plant shutdown would be required. An additional 168 hours was requested to restore SGK05A to a functional status such that the Completion Time of LCO 3.0.3 would expire at 1111 CDT on June 24, 2013. The Nuclear Regulatory Commission granted approval of the requested enforcement discretion on June 17, 2013.

When the enforcement discretion was received, the plant shutdown was stopped and stabilized at 150 MWe. The plant returned to full power at approximately 1430 CDT on June 18, 2013.

The replacement of the SGK05A compressor and testing to restore functionality was completed at 2220 CDT on June 21, 2013.

BASIS FOR REPORTABILITY

Wolf Creek Nuclear Operating Corporation (WCNOC) requested and received a notice of enforcement discretion (NOED) from the NRC to not enforce compliance with the actions required in TS 3.8.4, TS 3.8.7, TS 3.8.9, as well as LCO 3.0.3. for a period of 168 hours. The SGK05A unit was nonfunctional for a period longer than allowed by the Completion Time of LCO 3.0.3. As such, the event is reportable pursuant to 10 CFR 50.73(a)(2)(i)(B) for any operation or condition which was prohibited by the plant's TSs.

LCO 3.0.3 requires action to be taken within 1 hour to place the plant in Mode 3 within 7 hours, in Mode 4 within 13 hours, and in Mode 5 within 37 hours. LCO 3.0.3 was entered in light of the limitations of the Conditions and Required Actions of TS 3.8.7, "Inverters - Operating." Therefore, absent a support system TS LCO to declare inoperable, the control room staff is required to enter LCO 3.0.3 when a Class 1E electrical equipment A/C train is discovered to be nonfunctional, resulting in an unnecessary plant transient.

Required Actions B.1 and B.2 of TS 3.8.4 would require placing the plant in Mode 3 in 6 hours and Mode 5 in 36 hours if Required Action A.1 (restore DC electrical power subsystem to Operable status) and it associated Completion Time (2 hours) is not met. Required Actions B.1 and B.2 of TS 3.8.7 would require placing the plant in Mode 3 in 6 hours and Mode 5 in 36 hours if Required Action A.1 (restore one required inverter to Operable status) and it associated Completion Time (24 hours) are not met. Required Actions E.1 and E.2 of TS 3.8.9 would require placing the plant in MODE 3 in 6 hours and Mode 5 in 36 hours if Required Actions C.1 and D.1 (restore one AC vital bus subsystem and one DC electrical power distribution subsystem to Operable status) and its associated Completion Time (2 hours) is not met.

ROOT CAUSE

The direct cause of the SGK05A compressor failure occurred from a liquid slug drawn into the compressor resulting in a sudden over pressurization in the cylinder compression volume. One or more thermostatic expansion valves [EIIS: VI, TCV] (TXVs) failed open intermittently due to residue on the valve internals. The root cause is that inadequate actions, specifically the chemical flush and evacuation of the system, were taken to restore SGK05A in May 2013. In May 2013, a chemical flush was performed after the failure of a filter-drier [EIIS: VI, FLT] in the system allowed filter element material to enter the refrigerant stream resulting in blockage of the TXVs. This was reported in LER 2013-006-01.

CORRECTIVE ACTIONS

The SGK05A compressor was replaced. The evaporator TXV internals and hot gas bypass valve internals were replaced. Internal inspections were conducted with a boroscope that verified there was no internal contamination.

Procedure MPE GK-004, "GK Unit Preparation for Work," will be revised to include critical steps that are important for ensuring an effective flush and evacuation of the Class 1E electrical equipment A/C system.

SAFETY SIGNIFICANCE

The Incremental Conditional Core Damage Probability (ICCDP) and Incremental Conditional Large Early Release Probability (ICLERP) was quantified for the requested additional time for replacing the SGK05A unit. The ICCDP calculated value was 7.038E-8 and the ICLERP calculated value was 6.137E-10. The results of the quantification are within the guidance threshold in Regulatory Issue Summary 2005-01, "Changes to Notice of Enforcement Discretion (NOED) Process and Staff Guidance."

Temporary cooling was put in place for the spaces normally cooled by SGK05A. This cooling was a temporary A/C unit (elephant trunk type) powered by reliable non-safety power. A second unit was available in case of failure. Monitoring of room temperature was performed every two hours and a fire watch was established to compensate for the fire barriers that were breached by the temporary AC units.

OPERATING EXPERIENCE/PREVIOUS SIMILAR OCCURRENCES

LER 2012-005-00 reported a Class 1E electrical equipment A/C train was declared nonfunctional due to a calculation that concluded one train of air conditioning was not capable of supporting both trains of Class 1E equipment. Technical Requirement (TR) 3.7.23 allowed a train to be nonfunctional if compensatory measures were established for the affected unit. During the operability determination and functionality assessment process, it was determined that the operability of the associated train Class 1E electrical equipment could not be maintained without additional compensatory measures and for a limited period of time.

LER 2013-004-00 reported one train of Class 1E electrical equipment air conditioning had been nonfunctional and one train of control room air conditioning had been inoperable during the previous cycle. This was discovered during refueling outage 19 when the SGK05A compressor terminal box mounting screws were found over torqued. This resulted in a condition prohibited by Technical Specification and a condition that could have prevented the fulfillment of a safety function.

LER 2013-006-01 reported one train of Class 1E electrical equipment air conditioning had been nonfunctional due to a partial blockage of the thermostatic expansion valves feeding the SGK05A evaporator coils. This resulted in a plant shutdown required by Technical Specifications.